HITACHI

MODEL VS-025
X-Y MONITOR

SERVICE MANUAL

Hitachi Denshi, Ltd.

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NOTICE

This Service Manual describes the most typical product of this model. If there are any specific differences between this Manual and the servicing unit, please contact Hitachi Denshi sales office in your area.

MODEL VS-025
X-Y MONITOR
Service Manual

1. SPECIFICATIONS

* CRT

Type	:	7" rectangular tube
Height and width	:	100 x 120 mm (3.94 x 4.73 in) approx.
Phosphor	:	P31
Accelerating potential	:	18 kV approx.
Spot size	:	0.45 mm approx. (center of the screen)

* X-axis and Y-axis

Frequency bandwidth	:	DC to 5 MHz -3 dB
Deflection sensitivity	:	200 mV/div, 500 mV/div, 1 V/div (Selectable by using internal connectors) Continuously variable by 2.5x
Input impedance	:	1 MΩ approx. in parallel with 50 pF or less
Phase difference between X and Y axes	:	1 MHz, 3 ° or less
Maximum input voltage	:	±50 V (DC + AC peak)
Linearity	:	5 % or less
Settling time	:	0.5 μs or less until the spot is settled within ±0.5 mm for a specified position

* Z axis

Frequency bandwidth	:	DC to 5 MHz
Input sensitivity	:	1 V

*	Power supply	
	Voltage	: 100/120/220/240 V ±10 %
	Frequency	: 48 to 440 Hz
	Power consumption	: 40 W approx.
*	Dimensions	: 133(H) x 216(W) x 500(D) mm (5.3 x 8.6 x 19.7 in) approx.
*	Weight	: 7 kg (15.4 lb) approx.
*	Temperature	
	Operating	: 0 to +50 °C (32 to 122 °F)
	Rating	: +10 to +35 °C (50 to 95 °F)
	Storage	: -20 to +70 °C (-4 to +158 °F)

2. ACCESSORIES

This instrument is shipped along with following accessories.

1 Fuse (2 A for 100 V set or 1 A for 200 V set)
1 AC power cord
1 Operation Manual

3. PREVENTIVE MAINTENANCE

Preventive maintenance, when performed on a regular basis, can prevent instrument breakdown and may improve the reliability of the X-Y monitor. The severity of environment to which this instrument is subjected will determine the frequency of maintenance. A convenient time to perform preventive maintenance is just prior to the recalibration of the instrument.

Disassembly

Remove the 4 screws in the cover of the instrument. Gently remove the cover from the instrument. Most of the internal parts of the instrument are now accessible.

Cleaning

The instrument should be cleaned as often as the operating conditions require, since the accumulation of dirt in the instrument may cause the

component breakdown. The covers can provide protection against dust in the interior of the instrument. Loose dust accumulated on these covers can be removed with a soft cloth or small brush.

Dirt that remains can be removed with a soft cloth applying a mild detergent and water solution. Abrasive cleaners should not be used.

Cleaning the interior should be only occasionally necessary. The best way to clean the interior is to blow off the dust with a dry, low-velocity stream of air. A soft-bristle brush or a cotton-tipped applicator is useful for cleaning narrow spaces or for cleaning more delicate components.

Visual Inspection

The instrument should be inspected occasionally for such defects as broken connections, improperly seated transistors, damaged circuit boards, and heat-damaged parts. The corrective procedure for most visible defects is apparent; however, particular care must be taken if heat-damaged components are found. Overheating usually indicated other trouble in the instrument; therefore, correcting the cause of the overheating is important to prevent the recurrence of the damage.

4. CALIBRATION

Hitachi Denshi, Ltd. provides complete instrument repair and re-calibration at our office, and authorized dealer. Contact your local Hitachi Denshi, Sales office or representative.

4.1 Calibration interval

To maintain instrument accuracy, perform the calibration of the VS-025 at least every 1000 hours of operations or every six month if used in-frequently.

4.2 Test equipment required

The following test equipment and accessories, or its equivalent, are required for the complete calibration of the VS-025. Specifications given for the test equipment are the minimum necessary for accurate calibration. Therefore, the specifications of any test equipment used must meet or exceed the listed specifications. All the test equipment is assumed to be correctly calibrated and operated within the listed specification. Operating instructions for the test equipment are not given in this procedure. Refer to the instruction manual for the test equipment if more information is needed.

4.3 Preliminary procedure

This instrument should be calibrated at an ambient temperature of +20 °C ($\pm$5 °C) for best overall accuracy.

1. Connect the instrument to AC line voltage, 50/60/400 Hz line source.
2. Set the instrument controls as given in the preliminary control settings. Allow at least fifteen minutes of warmup before proceeding.
3. See the adjustment locations in the pullout pages.

Table 4-2

TEST EQUIPMENT REQUIRED

Description	Minimum specification	Usage	Example of applicable test equipment
1. Constant amplitude signal generator	50kHz reference frequency; maximum frequency 10MHz; variable amplitude.	Check horizontal, vertical bandwidth.	
2. Standard amplitude calibrator	Amplitude accuracy: 0.25%, variable amplitude; 5mV to 40V; frequency: 1 kHz square wave.	Check horizontal and vertical gain.	
3. Square-wave generator	Variable frequency: 10Hz to 1MHz; output amplitude; 10mV to 100V.	Check horizontal and vertical compensation.	
4. Digital voltmeter	0.1% accuracy.	Check power supply	
5. Cable	Impedance, 50 ohms; type, RG-58/U; length, 42 inches, connectors, BNC		Hitachi part No.4202

4.4 Preliminary control settings

Set the instrument controls as follows, when starting the calibration procedures.

Controls	Setting
X·GAIN	Fully counter clockwise
Y·GAIN	

4.5 Initial starting procedure

1. Rotate the INTENsity control to the midrange and set the POWER switch to ON.
2. Wait a few seconds for the cathode ray tube (CRT) to warm up. A trace should appear on the display of the CRT.
3. If trace disappears, increase (clockwise) the INTENsity control setting until the trace is easily observed.
4. Adjust the FOCUS control for the best focused display.
5. Readjust the POSITION controls if necessary, to center the trace.

POWER SUPPLY SYSTEM

NOTE

Before you start operation see the adjustment locations in the pullout pages.

Control settings

Preset the controls as given in the preliminary control setting.

① Check low-voltage supply, if necessary.

a. Connect the digital voltmeter (DVM) between the +12 V line (IC1102) and ground

: 11.8 to 12.2 V

b. Connect the DVM between the -12 V line IC1103 and ground
: -11.85 to -12.15 V

c. Connect the DVM between the +100 V line D1102-K and ground
: +99.9 to +100.1 V

d. Connect the DVM from the +150 V line D1111-K and ground
: +140 to 160 V

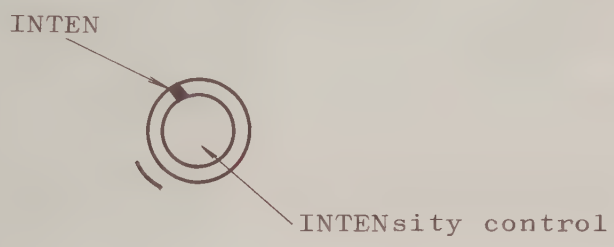
DISPLAY

Control setting

Preset the controls as given in the preliminary control setting.

② Check/adjust CRT bias.

a. Set the INTENsity to the "T" letter of the "INTENsity" as shown.



b. Observe the trace on the CRT.

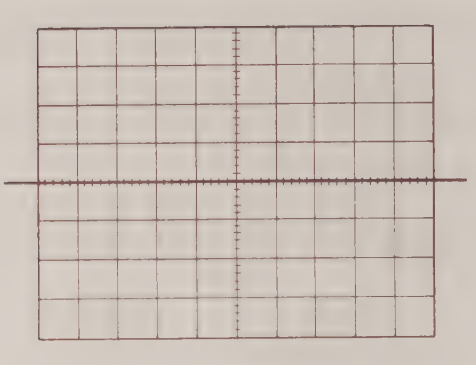
c. Adjust the Grid Bias Adjustment RV1001 so that the trace just appears.

③ Check/adjust trace rotation.

a. Position the trace to the center graticule line.

b. Check that the trace is in parallel with the center horizontal line.

c. Adjust TRACE ROTATION (screwdriver adjustment on side panel) for a trace that is in parallel with the horizontal graticule lines.



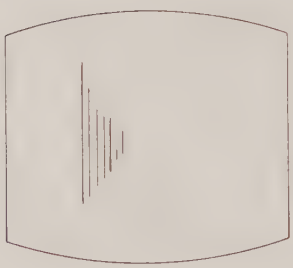
④ Check/adjust GEOMetry.

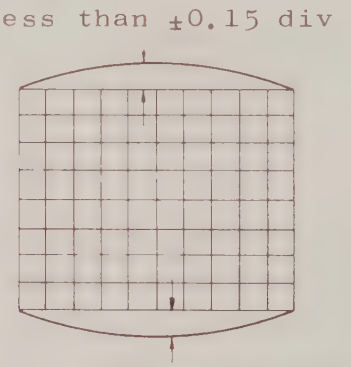
a. Connect the constant amplitude signal generator to the input.

b. Set the GAIN variable resistor setting for a full-screen (8 div/ 50 kHz) deflection.

c. Check that horizontal bowing is less than ±0.15 division.

d. Adjust the GEOM adjustment RV1002 for a display that is in parallel with top and bottom horizontal lines.

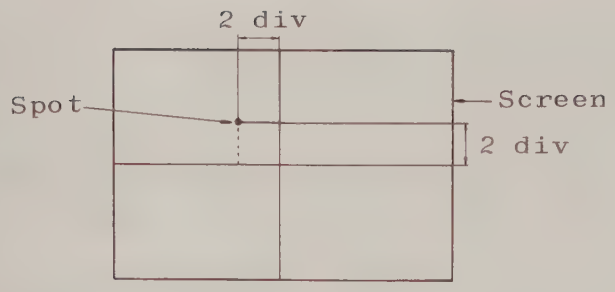




⑤ Check/adjust ASTIGmatism and FOCUS.

a. Set the input coupling switch to GND.

b. Set the INTENsity control for a small spot, as the following figure, using the position controls.



⑥ Check/adjust positioning range.

a. Rotate the X-GAIN and Y-GAIN controls fully counterclockwise.

b. Supply a signal of 1.2 Vp-p to both the input terminals.
Six divisions display will be obtained by the signal.

c. Set RV204(X) and RV104(Y) so that displayed waveforms move beyond the graticule area when the position controls are rotated extremely.

⑦ Check/adjust DC balance.

a. Connect the +X and -X input terminals to the ground.

b. Set RV205 for minimum voltages at terminals CH3 and CH4 on the PEF-772 unit.
Collector voltages of TR202 and TR203 will be minimized by this setting.

c. Connect the +Y and -Y input terminals to the ground.

d. Set RV105 for minimum voltages at terminals CH3 and CH4 on the PEF-773 unit.
Collector voltages of TR102 and TR103 will be minimized by this setting.

⑧ Check/adjust vertical gain.

a. Connect the standard amplitude calibrator to the input connector.

b. Set the standard amplitude calibrator for a 1 Vp-p (5 divisions of display) signal.

c. Check for a display of five divisions.

d. Adjust the GAIN adjustment RV102 (Y), RV202 (X) for a display of 5 divisions within 2 %.

⑨ Check/adjustment trace position stability.

a. Set RV203 so that the trace position move is less than 0.5 div. when the X-GAIN control on the front panel is rotated.

b. Set RV103 so that the trace position move is less than 0.5 div. when the Y-GAIN control on the front panel is rotated.

⑩ Check/adjust vertical step response.

a. Set the X and Y switchs to the 200 mV position.

b. Connect the fast-rise, positive output (1 V, 100 kHz) of the square-wave generator to the X input. Use a 50 Ω termination and cable.

c. Adjust the square-wave generator output for 5-divisions display.

d. Preset RV201, RV206 and CV210, the wave-form shown in the figure (1)

(1) (2) (3) (4) (5)

e. Adjust RV206 for the best flat top as the figure (2).

f. Adjust RV201 for the best corner of the displayed signal.

g. Adjust CV210 to get the overshoot of +0.2 div. (see the figure (4))

h. Connect the output of the square-wave generator to the Y input.

i. Adjust RV101, RV106 and CV110 to get the overshoot of 0.2 div.

㉑ Check/adjust attenuation compensation.

(ATT : 10, 100)

a. Connect the square-wave generator to the X (Y) input terminal check for a square wave that is flat (flat top) under the following settings.

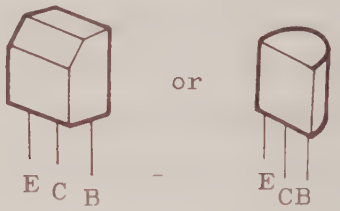
ATT	Square-wave generator output
500 mV	2 V
1 V	5 V

c. Adjust the trimmer condensers (refer to the circuit board illustration with adjustment location - page 27) for a square wave that is flat (flat top) under the following settings.

ATT	Square-wave generator output	Adjust X	Adjust (Y)
500 mV	2 V	+CV202 -CV205	CV102 CV105
1 V	5 V	+CV203 -CV206	CV103 CV100

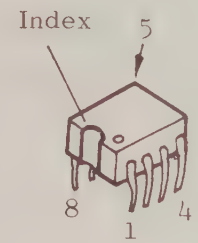
5. SEMICONDUCTOR LEAD CONFIGURATIONS

Lead configurations and case styles are typical, but may vary due to vendor changes or instrument modifications.

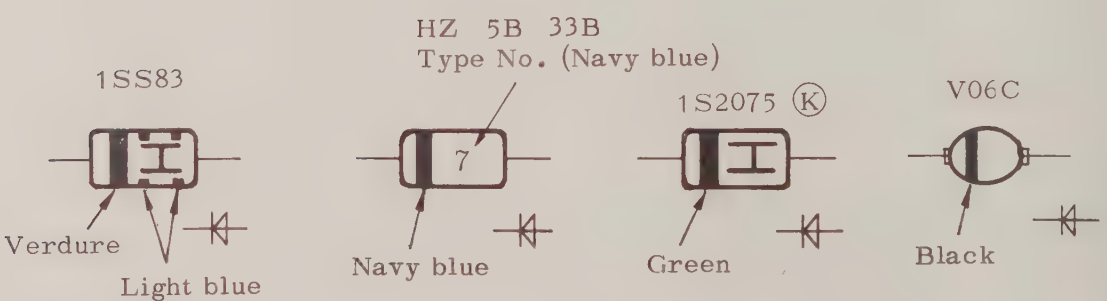


Plastic case transistors

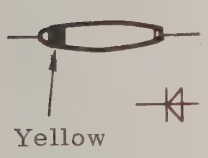
Flat pack



Integrated circuits

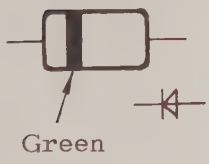


Y-10GA

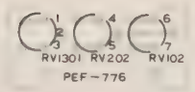


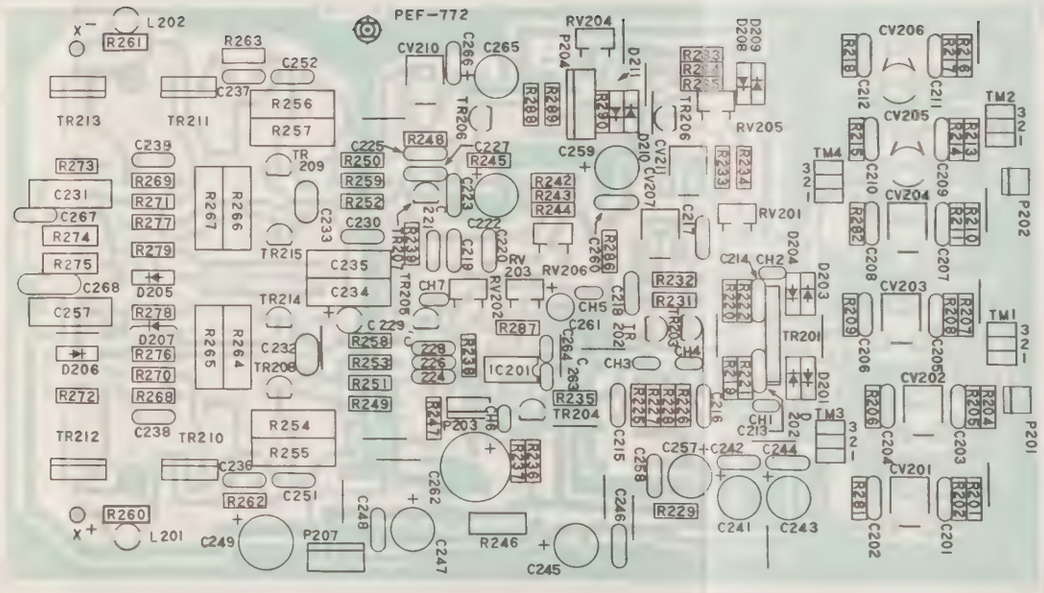
SR103D

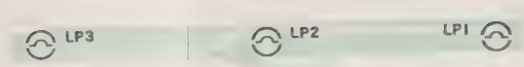
1SS110



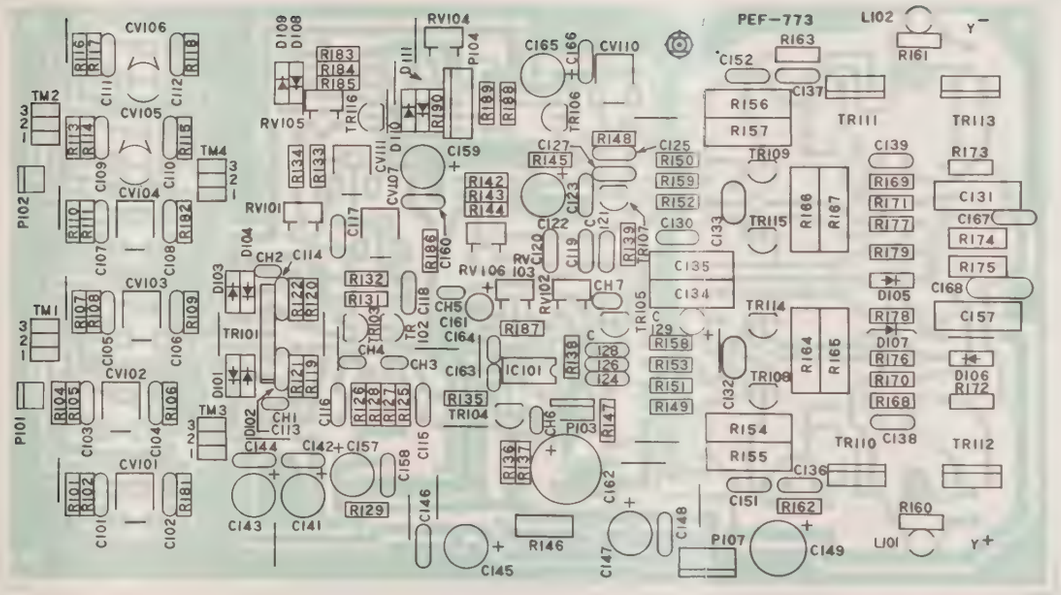
6. ELECTRICAL PARTS ARRANGEMENT

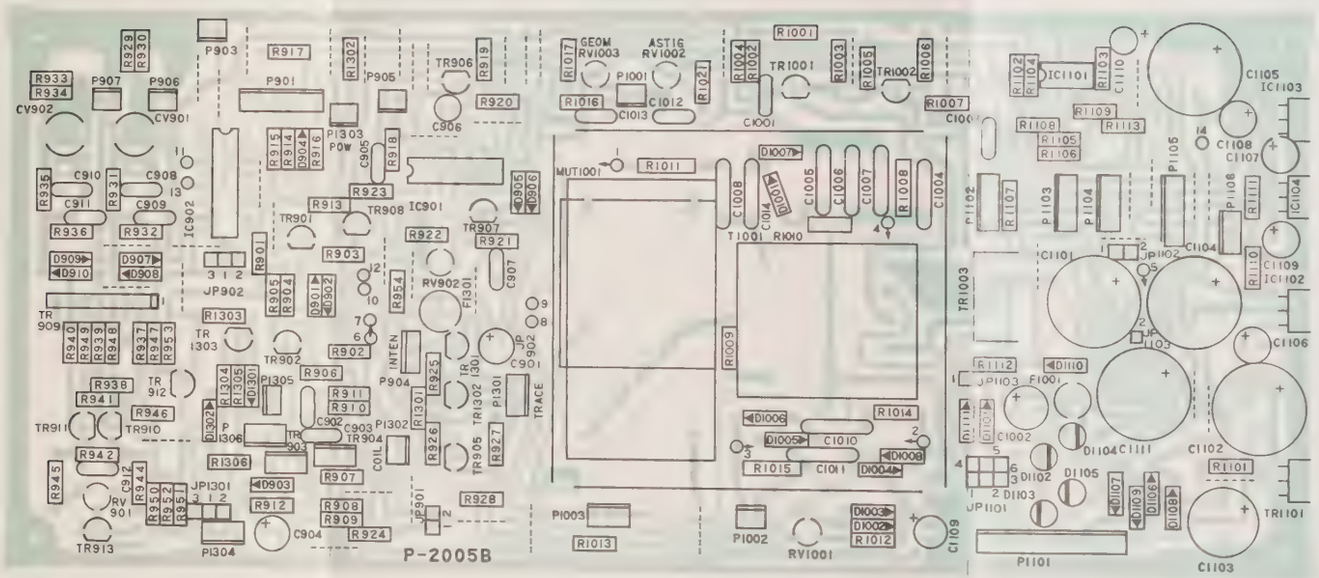





LP3
LP2
LP1

PEF-774


PEF-773
L102
L101
TM1
TM2
TM3
TM4
P101
P102
P103
P104
P107
P111
CV101
CV102
CV103
CV104
CV105
CV106
CV107
CV108
CV109
CV110
CV111
RV101
RV102
RV103
RV104
RV105
RV106
TR101
TR102
TR103
TR104
TR105
TR106
TR107
TR108
TR109
TR110
TR111
TR112
TR113
TR114
TR115
IC101
CH1
CH2
CH3
CH4
CH5
CH6
CH7
D101
D102
D103
D104
D105
D106
D107
D108
D109
D110


P-2005B

7. ELECTRICAL PARTS LIST

PANEL and OTHERS

Symbol	Part Code	Description	Remarks
D 1302	HDS0405	Diode SG203DA	
TR1304	HTD0155	Transistor 2SD313E	
J 101	8466952	Connector 171825-2	
J 102	8466952	Connector 171825-2	
J 103	JBX0468	Connector 171825-3	
J 104	JBX0468	Connector 171825-5	
J 107	JBX0704	Connector 171825-4	
J 201	8466952	Connector 171825-2	
J 202	8466952	Connector 171825-2	
J 203	JBX0468	Connector 171825-3	
J 204	8466952	Connector 171825-5	
J 207	JBX0704	Connector 171825-4	
J 904	JBX0468	Connector 171825-3	
J 905	8466952	Connector 171825-3	
J 906	8466952	Connector 171825-2	
J 907	8466952	Connector 171825-2	
J 1001	8466952	Connector 171825-2	
J 1002	8466952	Connector 171825-2	
J 1003	JBX0468	Connector 171825-3	
J 1101	JBX0703	Connector 171825-0	
J 1102	JBX0704	Connector 171825-4	
J 1103	JBX0704	Connector 171825-4	
J 1301	JBX1468	Connector 171825-3	
J 1302	8466952	Connector 171825-2	
J 1303	8466952	Connector 171825-2	
J 1304	JBX0468	Connector 171825-3	
J 1305	8466952	Connector 171825-2	
J 1306	JBX0468	Connector 171825-3	
CN 101	JHB0088	Connector BNC-071	
CN 102	JHB0088	Connector BNC-071	
CN 201	JHB0088	Connector BNC-071	
CN 202	JHB0088	Connector BNC-071	
CN 301	JHB0088	Connector BNC-071	
CN 302	JHB0088	Connector BNC-071	
CN1101	8455061	Connector GSS42R34-3131-200C3	
CRT	8457616A	CRT E8339B31 (non graticule)	
CRT	8457616B	CRT E8340B31 (with graticule)	
	8390152	Socket 1339	
T 1101	8466957	XFMR DN-Y-0395	
S 101	8466938	SW, Slide SSS323	
S 201	8466938	SW, Slide SSS323	
S 301	8466938	SW, Slide SSS323	
L 1301	3203318	Coil For rotation	
LP1301	8329332	Lamp 4W-8	
LP1302	8329332	Lamp 4W-8	
LP1303	8329332	Lamp 4W-8	
LP1304	8329332	Lamp 4W-8	
LP1305	8329332	Lamp 4W-8	
LP1306	8329332	Lamp 4W-8	
R 1018	RCR3100	R, Carbon 1/4W 100kΩ ±5%	
R 1019	RCR3440	R, Carbon 1/4W 2.2MΩ ±5%	
RV 102	RNT0187	VR, Metal EVN38C00YB52	
RV 103	8348452	VR, Carbon EVH COAP 20B14	
RV 202	RNT0187	VR, Metal EVN38C00YB52	
RV 203	8348452	VR, Carbon EVHCOAP20B14	
RV 901	8348452	VR, Carbon EVHCOAP20B14	
RV 1004	RNE0069	VR, Carbon EVMNDGK20B26	
RV 1301	RNT0191	EVN38C00YB14	
S 1101	8400067	SW, PB SDV 3P	

X-AMP

Symbol	Part Code	Description	Remarks
C 201	CQA0099	C, Plastic 50V 0.022μF ±10%	
C 203	CCC1011	C, Ceramic 50V 33 pF ±5%	
C 204	CCC1014	C, Ceramic 50V 47 pF ±5%	
C 205	CCC1007	C, Ceramic 50V 22 pF ±5%	
C 206	CCC1025	C, Ceramic 50V 100 pF ±5%	
C 207	CQA0099	C, Plastic 50V 0.022μF ±10%	
C 209	CCC1011	C, Ceramic 50V 33 pF ±5%	
C 210	CCC1014	C, Ceramic 50V 47 pF ±5%	
C 211	CCC1007	C, Ceramic 50V 22 pF ±5%	
C 212	CCC1025	C, Ceramic 50V 100 pF ±5%	
C 216	CCC1007	C, Ceramic 50V 22 pF ±5%	
C 218	CCC1032	C, Ceramic 50V 82 pF ±5%	
C 220	CQA0103	C, Plastic 50V 0.1μF ±10%	
C 222	CES0037	C, AL Elyc 25V 47μF ±20%	
C 223	CQA0097	C, Plastic 50V 0.01μF ±10%	
C 225	CCC1007	C, Ceramic 50V 22 pF ±5%	
C 227	CCC1034	C, Ceramic 50V 68 pF ±5%	
C 224	CCC1002	C, Ceramic 50V 10 pF ±5%	
C 229	8389725B	C, AL Elyc 50V(105°C)10μF ±20%	
C 230	CQA0097	C, Plastic 50V 0.01μF ±10%	
CV 211	CCC1162	C, Ceramic 50V 470 pF ±5%	
C 231	CCD0286	C, Ceramic 500V 1000 pF +100 -0%	
C 232	CCD0286	C, Ceramic 500V 1000 pF +100 -0%	
C 233	CCD0287	C, Ceramic 500V 4700 pF +100 -0%	
C 234	CCD0192	C, Ceramic 500V 10000 pF +100 -0%	
C 235	CCD0192	C, Ceramic 500V 10000 pF +100 -0%	
C 236	CQA0103	C, Plastic 50V 0.1μF ±10%	
C 237	CQA0103	C, Plastic 50V 0.1μF ±10%	
C 241	CES0031	C, AL Elyc 25V 47μF ±20%	
C 242	CCC1030	C, Plastic 50V 0.01μF ±10%	
C 243	CES0032	C, AL Elyc 25V 47μF ±20%	
C 244	CCC1030	C, Ceramic 50V 0.01μF +100 -0%	
C 245	CES0037	C, AL Elyc 25V 47μF ±20%	
C 246	CCC1030	C, Plastic 50V 0.01μF ±10%	
C 247	CES0032	C, AL Elyc 25V 47μF ±20%	
C 248	CCC1030	C, Ceramic 50V 0.01μF +100 -0%	

Symbol	Part Code	Description	Remarks
C 249	CES0141	C, AL Elyc 250V 4.7μF ±20%	
C 251	CCD0272	C, Ceramic 500V 1 pF ±0.25pF	
C 252	CCD0272	C, Ceramic 500V 1 pF ±0.25pF	
C 257	CES0032	C, AL Elyc 25V 47μF ±20%	
C 258	CCC1030	C, Ceramic 50V 0.01μF +100% -0	
C 259	CES0032	C, AL Elyc 25V 47μF ±20%	
C 260	CCC1030	C, Ceramic 50V 0.01μF +100% -0	
C 261	CES0101	C, AL Elyc 16V 10μF ±20%	
C 262	CES0277	C, AL Elyc 6.3V 2200μF ±20%	
C 263	CCC1030	C, Ceramic 50V 0.01μF +100% -0	
C 264	CCC1030	C, Ceramic 50V 0.01μF +100% -0	
C 267B	CCD0192	C, Ceramic 500V 1000 pF +100% -0	
CV 202	CVE0005	C, Variable ECV-1ZW 10x32E	
CV 203	CVE0005	C, Variable ECV-1ZW 10x32E	
CV 205	CVE0005	C, Variable ECV-1ZW 10x32E	
CV 206	CVE0005	C, Variable ECV-1ZW 10x32E	
CV 207	CVE0004	C, Variable ECV-1ZW 10x40	
CV 210	8407818	C, Variable ECV-1ZW 40x40	
D 201	HDS0108	Diode 1S2075K	
D 202	HDS0108	Diode 1S2075K	
D 203	HDS0108	Diode 1S2075K	
D 204	HDS0108	Diode 1S2075K	
D 205	HDH0029	Diode HZ5B	
D 206	HDH0029	Diode HZ5B	
D 207	HDH0029	Diode HZ5B	
D 208	HDS0108	Diode 1SZ075K	
D 209	HDS0108	Diode 1SZ075K	
D 210	HDS0108	Diode 1SZ075K	
C 265	CES0032	C, AL Elyc 25V 47μF ±20%	
C 266	CCC1030	C, Ceramic 50V 0.01μF +100% -0	
C 269	CQA0103	C, Plastic 50V 0.1μF ±10%	
TR 201	HTK0011	Transistor 2SK30A	
TR 202	HTC0338	Transistor 2SC1906	
TR 203	HTC0338	Transistor 2SC1906	
TR 204	HTA0099	Transistor 2SA781	
TR 205	HTC0338	Transistor 2SC1906	
TR 206	HTC0148	Transistor 2SC458C	
TR 207	HTC0338	Transistor 2SC1906	
TR 208	HTC0192	Transistor 2SC641K-C	
TR 209	HTC0193	Transistor 2SC641K-C	
TR 210	8460806	Transistor 2SC2238 B, Y	
TR 211	8460806	Transistor 2SC2238 B, Y	
TR 212	8460804	Transistor 2SA968 B, Y	
TR 213	8460804	Transistor 2SA968 B, Y	
TR 214	HTC0338	Transistor 2SA781K	
TR 215	HTC0338	Transistor 2SA781K	
TR 216	HTC0338	Transistor 2SC1906	
TR 217	HTK0011	Transistor 2SK30AY	
IC 201	ILM0032	IC μPC151C	
RV 201	RNE0033	VR, Metal EVN32CA00B15 (100kΩ)	
RV 202	RNE0024	VR, Metal EVN32CA00B12 (100Ω)	
RV 203	RNE0027	VR, Metal EVN32CA00B13 (1kΩ)	
RV 204	RNE0027	VR, Metal EVN32CA00B13 (1kΩ)	
RV 205	RNE0027	VR, Metal EVN32CA00B13 (1kΩ)	
RV 206	RNE0030	VR, Metal EVN32CA00B14 (10kΩ)	

Symbol	Part Code	Description	Remarks
R 201	RMR3859	R, Metal 1/4W 1MΩ ±1%	
R 202	8466953G	R, Metal 1/4W 806kΩ ±1%	
R 205	8466953H	R, Metal 1/4W 604kΩ ±1%	
R 206	8466953I	R, Metal 1/4W 402kΩ ±1%	
R 208	8466953G	R, Metal 1/4W 806kΩ ±1%	
R 209	RME0702	R, Metal 1/4W 200kΩ ±1%	
R 210	RMR3859	R, Metal 1/4W 1MΩ ±1%	
R 211	8466953G	R, Carbon 1/4W 806kΩ ±5%	
R 214	8466953H	R, Metal 1/4W 604kΩ ±1%	
R 215	8466953I	R, Metal 1/4W 402kΩ ±1%	
R 217	8466953G	R, Metal 1/4W 806kΩ ±1%	
R 218	RME0702	R, Metal 1/4W 200kΩ ±1%	
R 219	RME0672	R, Metal 1/4W 4.75kΩ ±1%	
R 220	RME0672	R, Metal 1/4W 4.75kΩ ±1%	
R 221	RCK3056	R, Carbon 1/4W 1.5kΩ ±1%	
R 222	RCR3056	R, Carbon 1/4W 1.5kΩ ±5%	
R 227	RCR3059	R, Carbon 1/4W 2.0kΩ ±5%	
R 228	RCR3059	R, Carbon 1/4W 2.0kΩ ±5%	
R 229	RCR3028	R, Carbon 1/4W 100Ω ±5%	
R 232	8466953	R, Metal 1/4W 54.9kΩ ±1%	
R 233	RCR3036	R, Carbon 1/4W 220Ω ±5%	
R 234	RCR3036	R, Carbon 1/4W 220Ω ±5%	
R 235	RCR3028	R, Carbon 1/4W 100Ω ±5%	
R 236	RCR3047	R, Carbon 1/4W 620Ω ±5%	
R 237	RCR3021	R, Carbon 1/4W 51Ω ±5%	
R 238	RCR3049	R, Carbon 1/4W 750Ω ±5%	
R 239	RME0645	R, Carbon 1/4W 27Ω ±5%	
R 242	RCR3049	R, Carbon 1/4W 750Ω ±5%	
R 243	RCR3049	R, Carbon 1/4W 750Ω ±5%	
R 244	RCR3036	R, Carbon 1/4W 220Ω ±5%	
R 245	RCR3047	R, Carbon 1/4W 620Ω ±5%	
R 246	RCR3157	R, Carbon 1/2W 820Ω ±5%	
R 248	RCR3076	R, Carbon 1/4W 10kΩ ±5%	
R 249	RCR3042	R, Carbon 1/4W 390Ω ±5%	
R 250	RCR3042	R, Carbon 1/4W 390Ω ±5%	
R 251	RCR3036	R, Carbon 1/4W 220Ω ±5%	
R 252	RCR3036	R, Carbon 1/4W 220Ω ±5%	
R 253	RCR3012	R, Carbon 1/4W 22Ω ±5%	
R 254	RMR2900	R, Metal 1W 27kΩ ±5%	
R 255	RMR2900	R, Metal 1W 27kΩ ±5%	
R 256	RMR2900	R, Metal 1W 27kΩ ±5%	
R 257	RMR2900	R, Metal 1W 27kΩ ±5%	
R 258	RCR3102	R, Carbon 1/4W 220kΩ ±5%	
R 259	RCR3102	R, Carbon 1/4W 220kΩ ±5%	
R 260	RCR3036	R, Carbon 1/4W 220kΩ ±5%	
R 261	RCR3036	R, Carbon 1/4W 220Ω ±5%	
R 262	RCR3012	R, Carbon 1/4W 22Ω ±5%	
R 263	RCR3012	R, Czrbon 1/4W 22Ω ±5%	
R 264	8466958	R, Metal 1W 36kΩ ±5%	
R 265	8466958	R, Metal 1W 36kΩ ±5%	
R 266	8466958	R, Metal 1W 36kΩ ±5%	
R 267	8466958	R, Metal 1W 36kΩ ±5%	
R 268	RCR3012	R, Carbon 1/4W 22Ω ±5%	
R 269	RCR3012	R, Carbon 1/4W 22Ω ±5%	
R 270	RCR3016	R, Carbon 1/4W 33Ω ±5%	
R 271	RCR3016	R, Carbon 1/4W 33Ω ±5%	
R 272	RCR3016	R, Carbon 1/4W 33Ω ±5%	
R 273	RCR3016	R, Carbon 1/4W 33Ω ±5%	
R 274	RCR3203	R, Metal 1/2W 68kΩ ±5%	
R 275	RCR3203	R, Metal 1/2W 68kΩ ±5%	
R 276	RCR3052	R, Carbon 1/4W 1kΩ ±5%	
R 277	RCR3052	R, Carbon 1/4W 1kΩ ±5%	
R 278	RCR3033	R, Carbon 1/4W 160Ω ±5%	

Symbol	Part Code	Description	Remarks
R 279	RCR3033	R, Carbon 1/4W 160Ω ±5%	
R 281	RCR3028	R, Carbon 1/4W 100Ω ±5%	
R 282	RCR3028	R, Carbon 1/4W 100Ω ±5%	
R 283	8466953E	R, Metal 1/4W 8.06kΩ ±1%	
R 284	RCR3054	R, Carbon 1/4W 1.2kΩ ±5%	
R 285	RCR3034	R, Carbon 1/4W 180Ω ±5%	
R 286	RCR3028	R, Carbon 1/4W 100Ω ±5%	
R 287	RCR3063	R, Carbon 1/4W 3kΩ ±5%	
R 288	RCR3090	R, Carbon 1/4W 39kΩ ±5%	
R 289	RCR3085	R, Carbon 1/4W 24kΩ ±5%	
R 290	RCR3076	R, Carbon 1/4W 10kΩ ±5%	
R 247	RCR3004	R, Carbon 1/4W 10Ω ±5%	
R 292	RCR3037	R, Carbon 1/4W 240Ω ±5%	
L 201	TLF0034	Coil FL5H 220μH ±10%	
L 202	TLF0034	Coil FL5H 220μH ±10%	
P 201	8466952A	Connector 171825-2	
P 202	8466952A	Connector 171825-2	
P 203	JBX0468	Connector 171825-3	
P 204	8466952	Connector 171825-5	
P 207	JBX0704	Connector 171825-4	
TM 1-4	8466955	Connector	
CH 1-7	8466956	Pin	

Y-AMP

Symbol	Part Code	Description	Remarks
C 101	CQA0099	C, Plastic 50V 0.022μF ±10%	
C 103	CCC1011	C, Ceramic 50V 33pF ±5%	
C 104	CCC1014	C, Ceramic 50V 47pF ±5%	
C 105	CCC1007	C, Ceramic 50V 22pF ±5%	
C 106	CCC1025	C, Ceramic 50V 100pF ±5%	
C 107	CQA0099	C, Plastic 50V 0.022μF ±10%	
C 109	CCC1011	C, Ceramic 50V 33pF ±5%	
C 110	CCC1014	C, Ceramic 50V 47pF ±5%	
C 111	CCC1007	C, Ceramic 50V 22pF ±5%	
C 112	CCC1025	C, Ceramic 50V 100pF ±5%	
C 115	CCC1005	C, Ceramic 50V 18pF ±5%	
C 117	CCC1007	C, Ceramic 50V 22pF ±5%	
C 118	CCC1011	C, Ceramic 50V 33pF ±5%	
C 120	CQA0097	C, Plastic 50V 0.01μF ±10%	
C 122	CES0032	C, AL Elyc 25V 47μF ±20%	
C 123	CCC1030	C, Ceramic 50V 0.01μF +100 -0%	
C 129	CES0032	C, AL Elyc 25V 47μF ±20%	
C 130	CCC1030	C, Ceramic 50V 0.01μF +100 -0%	
C 131	CCC0327	C, Ceramic 500V 4700pF +80 -20%	
C 132	CCC0590	C, Ceramic 500V 4700pF +80 -20%	
C 133	CCC0590	C, Ceramic 500V 1000pF +80 -20%	

Symbol	Part Code	Description	Remarks
C 134	CCC0591	C, Ceramic 500V 10000pF +80 -20%	
C 135	CCC0591	C, Ceramic 500V 10000pF +80 -20%	
C 141	CES0032	C, AL Elyc 25V 47μF ±20%	
C 142	CCC1030	C, Ceramic 50V 10000pF +100 -0%	
C 143	CES0032	C, AL Elyc 25V 47μF ±20%	
C 144	CCC1030	C, Ceramic 50V 10000pF +100 -0%	
C 145	CES0032	C, AL Elyc 25V 47μF ±20%	
C 146	CCC1030	C, Ceramic 50V 10000pF +100 -0%	
C 147	CES0032	C, AL Elyc 25V 47μF ±20%	
C 148	CCC1030	C, Ceramic 50V 10000pF +100 -0%	
C 149	CES0141	C, AL Elyc 250V 4.7μF ±20%	
C 151	CCC1138	C, Ceramic 500V 2pF ±0.25pF	
C 152	CCC1138	C, Ceramic 500V 2pF ±0.25pF	
C 157	CES0032	C, AL Elyc 25V 47μF ±20%	
C 158	CCC1030	C, Ceramic 50V 10000pF +100 -0%	
C 159	CES0032	C, AL Elyc 25V 47μF ±20%	
C 160	CCC1030	C, Ceramic 50V 10000pF +100 -0%	
C 161	CES0101	C, AL Elyc 16V 10μF ±20%	
C 162	CES0277	C, AL Elyc 6.3V 2200μF ±20%	
C 163	CCC1030	C, Ceramic 50V 10000pF +100 -0%	
C 164	CCC1030	C, Ceramic 50V 10000pF +100 -0%	
C 165	CES0032	C, AL Elyc 25V 47μF ±20%	
C 157B	CCD0192	C, Ceramic 500V 1000pF +100 -0%	
CV 102	CVE0005	C, Variable ECV-1ZW 10x32E	
CV 103	CVE0005	C, Variable ECV-1ZW 10x32E	
CV 105	CVE0005	C, Variable ECV-1ZW 10x32E	
CV 106	CVE0005	C, Variable ECV-1ZW 10x32E	
CV 107	CVE0004	C, Variable ECV-1ZW 10x40	
CV 110	8407818B	C, Variable ECV-1ZW 40x40	
D 101	HDS0108	Diode 1S2075K	
D 102	HDS0108	Diode 1S2075K	
D 103	HDS0108	Diode 1S2075K	
D 104	HDS0108	Diode 1S2075K	
D 105	HDH0029	Diode HZ5B	
D 106	HDH0029	Diode HZ5B	
D 107	HDH0029	Diode HZ5B	
D 108	HDS0108	Diode 1S2075K	
D 109	HDS0108	Diode 1S2075K	
D 110	HDS0108	Diode 1S2075K	
D 111	HDS0108	Diode 1S2075K	
C 166	CCC1030	C, Ceramic 50V 10000pF +100 -0%	
C 169	CQA0103	C, Plastic 50V 0.1μF ±10%	
TR 101	HTK0011	Transistor 2SK30AY	
TR 102	HTC0338	Transistor 2SC1906	
TR 103	HTC0338	Transistor 2SC1906	
TR 104	HTA0099	Transistor 2SA781	
TR 105	HTC0338	Transistor 2SC1906	
TR 106	HTC0148	Transistor 2SC458C	
TR 107	HTC0338	Transistor 2SC1906	
TR 108	HTC0192	Transistor 2SC641K-C	
TR 109	HTC0192	Transistor 2SC641K-C	
TR 110	8460806	Transistor 2SC2238 B, Y	
TR 111	8460806	Transistor 2SC2238 B, Y	
TR 112	8460804	Transistor 2SA968 B, Y	

Symbol	Part Code	Description	Remarks
TR 113	8460804	Transistor 2SA968 B, Y	
TR 114	HTA0099	Transistor 2SA781K	
TR 115	HTA0099	Transistor 2SA781K	
TR 116	HTC0338	Transistor 2SC1906	
TR 117	HTK0011	Transistor 2SK30AY	
IC 101	ILM0032	IC μPC151C	
RV 101	RNE0033	VR, Metal EVN32CA00B15 (100k)	
RV 102	RNE0024	VR, Metal EVN32CA00B12 (100k)	
RV 103	RNE0027	VR, Metal EVN32CA00B13 (1k)	
RV 104	RNE0028	VR, Metal EVN32CA00B23 (2k)	
RV 105	RNE0027	VR, Metal EVN32CA00B13 (1k)	
RV 106	RNE0030	VR, Metal EVN32CA00B14 (10k)	
R 101	RMR3859	R, Metal 1/4W 1MΩ ±1%	
R 102	8466953G	R, Metal 1/4W 800kΩ ±1%	
R 105	8466953H	R, Metal 1/4W 604kΩ ±1%	
R 106	8466953I	R, Metal 1/4W 402kΩ ±1%	
R 108	8466953G	R, Metal 1/4W 806kΩ ±1%	
R 109	RME0102	R, Metal 1/4W 200kΩ ±1%	
R 110	RMR3859	R, Metal 1/4W 1MΩ ±1%	
R 114	8466953M	R, Metal 1/4W 604kΩ ±1%	
R 115	8466953I	R, Metal 1/4W 402kΩ ±1%	
R 117	8466953	R, Metal 1/4W 806kΩ ±1%	
R 118	RME0702	R, Metal 1/4W 200kΩ ±1%	
R 119	RME0672	R, Metal 1/4W 4.75kΩ ±1%	
R 120	RME0672	R, Metal 1/4W 4.75kΩ ±1%	
R 121	RCR3056	R, Carbon 1/4W 1.5kΩ ±5%	
R 122	RCR3056	R, Carbon 1/4W 1.5kΩ ±5%	
R 127	RCR3059	R, Carbon 1/4W 2.0kΩ ±5%	
R 128	RCR3059	R, Carbon 1/4W 2.0kΩ ±5%	
R 129	RCR3052	R, Carbon 1/4W 100Ω ±5%	
R 133	RCE3036	R, Carbon 1/4W 220Ω ±5%	
R 134	RCR3036	R, Carbon 1/4W 220Ω ±5%	
R 135	RCR3028	R, Carbon 1/4W 100Ω ±5%	
R 136	RCR3047	R, Carbon 1/4W 620Ω ±5%	
R 137	RCR3021	R, Carbon 1/4W 51Ω ±5%	
R 138	RCR3049	R, Carbon 1/4W 750Ω ±5%	
R 139	RCR3017	R, Carbon 1/4W 36Ω ±5%	
R 142	RCR3047	R, Carbon 1/4W 620Ω ±5%	
R 143	RCR3047	R, Carbon 1/4W 620Ω ±5%	
R 144	RCR3037	R, Carbon 1/4W 240Ω ±5%	
R 145	RCR3047	R, Carbon 1/4W 620Ω ±5%	
R 146	RCR3157	R, Carbon 1/2W 820Ω ±5%	
R 149	RME0660	R, Metal 1/4W 475Ω ±1%	
R 150	RME0660	R, Metal 1/4W 475Ω ±1%	
R 151	RCR3038	R, Carbon 1/4W 270Ω ±5%	
R 152	RCR3038	R, Carbon 1/4W 270Ω ±5%	
R 153	RCR3012	R, Carbon 1/4W 220Ω ±5%	
R 154	RMR2783	R, Metal 1W 15kΩ ±5%	
R 155	RMR2783	R, Metal 1W 15kΩ ±5%	
R 156	RMR2783	R, Metal 1W 15kΩ ±5%	
R 157	RMR2783	R, Metal 1W 15kΩ ±5%	
R 158	RCR3102	R, Carbon 1/4W 220kΩ ±5%	
R 159	RCR3102	R, Carbon 1/4W 220kΩ ±5%	
R 160	RCR3036	R, Carbon 1/4W 220Ω ±5%	
R 161	RCR3036	R, Carbon 1/4W 220Ω ±5%	
R 162	RCR3012	R, Carbon 1/4W 22Ω ±5%	
R 163	RCR3012	R, Carbon 1/4W 22Ω ±5%	
R 164	RMR2784	R, Metal 1W 22kΩ ±5%	
R 165	RMR2784	R, Metal 1W 22kΩ ±5%	
R 166	RMR2784	R, Metal 1W 22kΩ ±5%	
R			

Symbol	Part Code	Description	Remarks
R 167	RMR2784	R, Metal 1W 22kΩ ±5%	
R 168	RCR3012	R, Carbon 1/4W 22Ω ±5%	
R 169	RCR3012	R, Carbon 1/4W 22Ω ±5%	
R 170	RCR3016	R, Carbon 1/4W 33Ω ±5%	
R 171	RCR3016	R, Carbon 1/4W 33Ω ±5%	
R 172	RCR3016	R, Carbon 1/4W 33Ω ±5%	
R 173	RCR3016	R, Carbon 1/4W 33Ω ±5%	
R 174	RCR3199	R, Metal 1/2W 47kΩ ±5%	
R 175	RCR3199	R, Metal 1/2W 47kΩ ±5%	
R 176	RCR3052	R, Carbon 1/4W 1kΩ ±5%	
R 177	RCR3052	R, Carbon 1/4W 1kΩ ±5%	
R 178	RCR3035	R, Carbon 1/4W 200Ω ±5%	
R 179	RCE3035	R, Carbon 1/4W 200Ω ±5%	
R 181	RCR3028	R, Carbon 1/4W 100Ω ±5%	
R 182	RCR3028	R, Carbon 1/4W 100Ω ±5%	
R 183	8466953E	R, Carbon 1/4W 8.06kΩ ±5%	
R 184	RCR3054	R, Carbon 1/4W 1.2kΩ ±5%	
R 185	RCR3034	R, Carbon 1/4W 180Ω ±5%	
R 186	RCR3028	R, Carbon 1/4W 100Ω ±5%	
R 187	RCR3063	R, Carbon 1/4W 3kΩ ±5%	
R 188	RCR3081	R, Carbon 1/4W 16kΩ ±5%	
R 189	RCR3069	R, Carbon 1/4W 5.1kΩ ±5%	
R 190	RCR3065	R, Carbon 1/4W 3.6kΩ ±5%	
R 132	RME0810	R, Metal 1/4W 61.9kΩ ±1%	
R 192	RCR3037	R, Carbon 1/4W 240Ω ±5%	
L 101	TLF0034	Coil FL5H 220μH ±10%	
L 102	TLF0034	Coil FL5H 220μH ±10%	
P 101	8466952A	Connector 171825-2	
P 102	8466952	Connector 171825-2	
P 103	JBX0468	Connector 171825-3	
P 104		Connector 171825-5	
P 107	JBX0704	Connector 171825-4	
TM1-TM4	8466955	Connector	
CH1-CH7	8466956	Pin	

Z-AMP HV, LV

Symbol	Part Code	Description	Remarks
C 1001	CQA0122	C, Plastic 50V 0.047μF ±10%	
C 1002	CES0035	C, AL Elyc 50V 47μF ±20%	
C 1003	CQA0122	C, Plastic 50V 0.047μF ±10%	
C 1004	CCD0246	C, Ceramic 2kV 1000pF +80 -20%	
C 1005	8466954	C, Ceramic 3kV 4700pF +80 -20%	
C 1006	8466954	C, Ceramic 3kV 4700pF +80 -20%	
C 1007	8466954	C, Ceramic 3kV 4700pF +80 -20%	
C 1008	CCD0282	C, Ceramic 100V 47pF +80 -20%	
C 1009	CES0053	C, AL Elyc 100V 1μF ±20%	

Symbol	Part Code	Description			Remarks
C 1010	CCD0246	C, Ceramic	2kV	1000 pF +80 -20%	
C 1011	CCD0289	C, Ceramic	2kV	4700 pF +80 -20%	
C 1012	CCD0287	C, Ceramic	500V	4700 pF +80 -20%	
C 1013	CCD0287	C, Ceramic	500V	4700 pF +80 -20%	
C 1014	CCD0289	C, Ceramic	2kV	4700 pF +80 -20%	
C 1101	CES0140	C, AL Elyc	160V	10μF ±20%	
C 1102	CES0203FY	C, AL Elyc	250V	47μF ±20%	
C 1103	CES0201FY	C, AL Elyc	160V	47μF ±20%	
C 1104	CES0204FY	C, AL Elyc	250V	2200μF ±20%	
C 1105	CES0204FY	C, AL Elyc	250V	2200μF ±20%	
C 1106	CES0133	C, AL Elyc	16V	47μF ±20%	
C 1108	CES0133	C, AL Elyc	16V	47μF ±20%	
C 1111	CES0140	C, AL Elyc	160V	10μF ±20%	

POWER

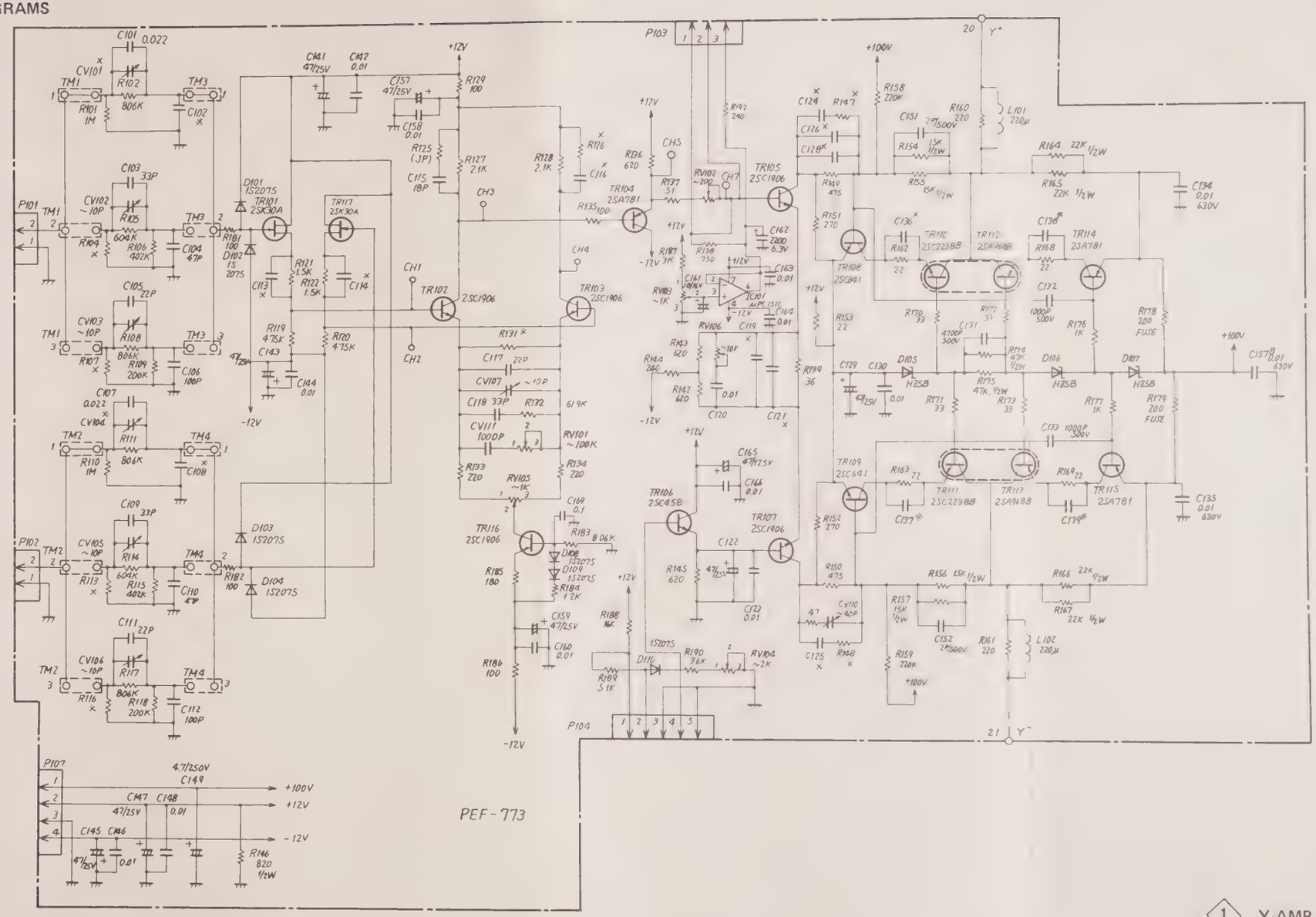
Symbol	Part Code	Description		Remarks
D 1001	HDY0031	Diode	Y10GA	
D 1002		Diode	HZ33	
D 1003	HDS0250	Diode	1SS83	
D 1004	HDS0250	Diode	1SS83	
D 1005	HDS0250	Diode	1SS83	
D 1006	HDS0250	Diode	1SS83	
D 1007	HDY0031	Diode	Y10GA	
D 1101	HDV0022	Diode	V06G	
D 1102	HDV0022	Diode	V06G	
D 1103	HDV0022	Diode	V06G	
D 1104	HDV0022	Diode	V06G	
D 1105	HDV0022	Diode	V06G	
D 1106	8460807	Diode	10D1	
D 1107	8460807	Diode	10D1	
D 1108	8460807	Diode	10D1	
D 1109	8460807	Diode	10D1	
D 1301	HDS0108	Diode	1S2705K	
TR1001	HTK0011	Transistor	2SK3D	
TR1002	HTA0224	Transistor	2SA1029D	
TR1003	HTD0155	Transistor	2SD313E	
TR1101	8460803	Transistor	2SA1009L	
TR1301	HTC0148	Transistor	2SC458C	
TR1302	HTA0224	Transistor	2SA1029D	
TR1303	HTA0224	Transistor	2SA1029D	
IC 1101	ILT0041	IC	TL071CP	
IC1102	8338426B	IC	HA17812P	
IC 1103	ILM0327	IC	μPC7912	
R 1001	8466953B	R, Metal	1/4W 105kΩ ±1%	
R 1002	8466953C	R, Metal	1/4W 825kΩ ±1%	

Symbol	Part Code	Description		Remarks
R 1003	RCR3102	R, Carbon	1/4W 220kΩ ±5%	
R 1004	RCR3052	R, Carbon	1/4W 1kΩ ±5%	
R 1005	RCR3092	R, Carbon	1/4W 47kΩ ±5%	
R 1006	RCR3069	R, Carbon	1/4W 5.1kΩ ±5%	
R 1007	RCR3028	R, Carbon	1/4W 100Ω ±5%	
R 1008	RMV0004	R, Metal	1/2W 22.1MΩ ±1%	
R 1009	RCR3076	R, Carbon	1/4W 10kΩ ±5%	
R 1010	RCR3072	R, Carbon	1/4W 6.8kΩ ±5%	
R 1011	RMV0010	R, Metal	1/2W 2.2MΩ ±1%	
R 1012	RCR3060	R, Carbon	1/4W 2.2kΩ ±5%	
R 1013	RCR3060	R, Carbon	1/4W 2.2kΩ ±5%	
R 1014	RCR3068	R, Carbon	1/4W 4.7kΩ ±5%	
R 1015	RMV0005	R, Metal	1/2W 10MΩ ±5%	
R 1016	RCR3076	R, Carbon	1/4W 10kΩ ±5%	
R 1017	RCR3084	R, Carbon	1/4W 22kΩ ±5%	
R 1101	RCR3100	R, Carbon	1/4W 100kΩ ±5%	
R 1102	RCR3080	R, Carbon	1/4W 15kΩ ±5%	
R 1103	RCR3052	R, Carbon	1/4W 1kΩ ±5%	
R 1104	RME0673	R, Metal	1/4W 5.62kΩ ±1%	
R 1105	RME0673	R, Metal	1/4W 5.62kΩ ±1%	
R 1106	RCR3060	R, Carbon	1/4W 2.2kΩ ±5%	
R 1107	8466953D	R, Metal	1/4W 90.9kΩ ±1%	
R 1108	RME0672	R, Metal	1/4W 4.75kΩ ±1%	
R 1109	RME0673	R, Metal	1/4W 5.62kΩ ±5%	
R 1301	RCR3028	R, Carbon	1/4W 100Ω ±5%	
R 1302	RCR3052	R, Carbon	1/4W 1kΩ ±5%	
R 1303	RCR3064	R, Carbon	1/4W 3.3kΩ ±5%	
R 1304	RCR3060	R, Carbon	1/4W 2.2kΩ ±5%	
R 1305	RCR3068	R, Carbon	1/4W 4.7kΩ ±5%	
RV 1001	RNT0194	VR, Metal	EVN38CA00B15	
RV 1002	RNT0194	VR, Metal	EVN38CA00B15	
RV 1003	RNT0194	VR, Metal	EVN38CA00B15	
F 1001	EFL0022	Fuse	FRH-0.2A	
F 1301	EFL0006	Fuse	FRH-0.1A	
T 1001	3184282	HVT-3F		
MUT1001	3184284	Multiplier	MR4A-5F	
NE 1001	ELL0019	Lamp	NE-Z	
NE 1002	ELL0019	Lamp	NE-Z	
P 1001	8466952	Connector	171825-2	
P 1002	8466952	Connector	171825-2	
P 1003	JBX0468	Connector	171825-3	
P 1101	JBX0703	Connector	1-171825-0	
P 1102	JBX0704	Connector	171825-4	
P 1103	JBX0704	Connector	171825-4	
P 1104	JBX0704	Connector	171825-4	
P 1105	JBX0454	Connector	171825-5	
P 1301	JBX0468	Connector	171825-3	
P 1302	8466952A	Connector	171825-2	
P 1303	8466952A	Connector	171825-2	
P 1304	JBX0468	Connector	171825-3	
P 1305	8466952A	Connector	171825-2	
P 1306	JBX0468	Connector	171825-3	
C 901	CES0133VA	C, AL Elyc	16V 47μF ±20%	
C 902	CCD0272VA	C, Ceramic	500V 1 pF ±0.25pF	
C 903	CCC0767	C, Ceramic	50V 4700 pF +100 -0%	
C 904	CEJ0033VA	C, AL Elyc	160V 1μF ±20%	

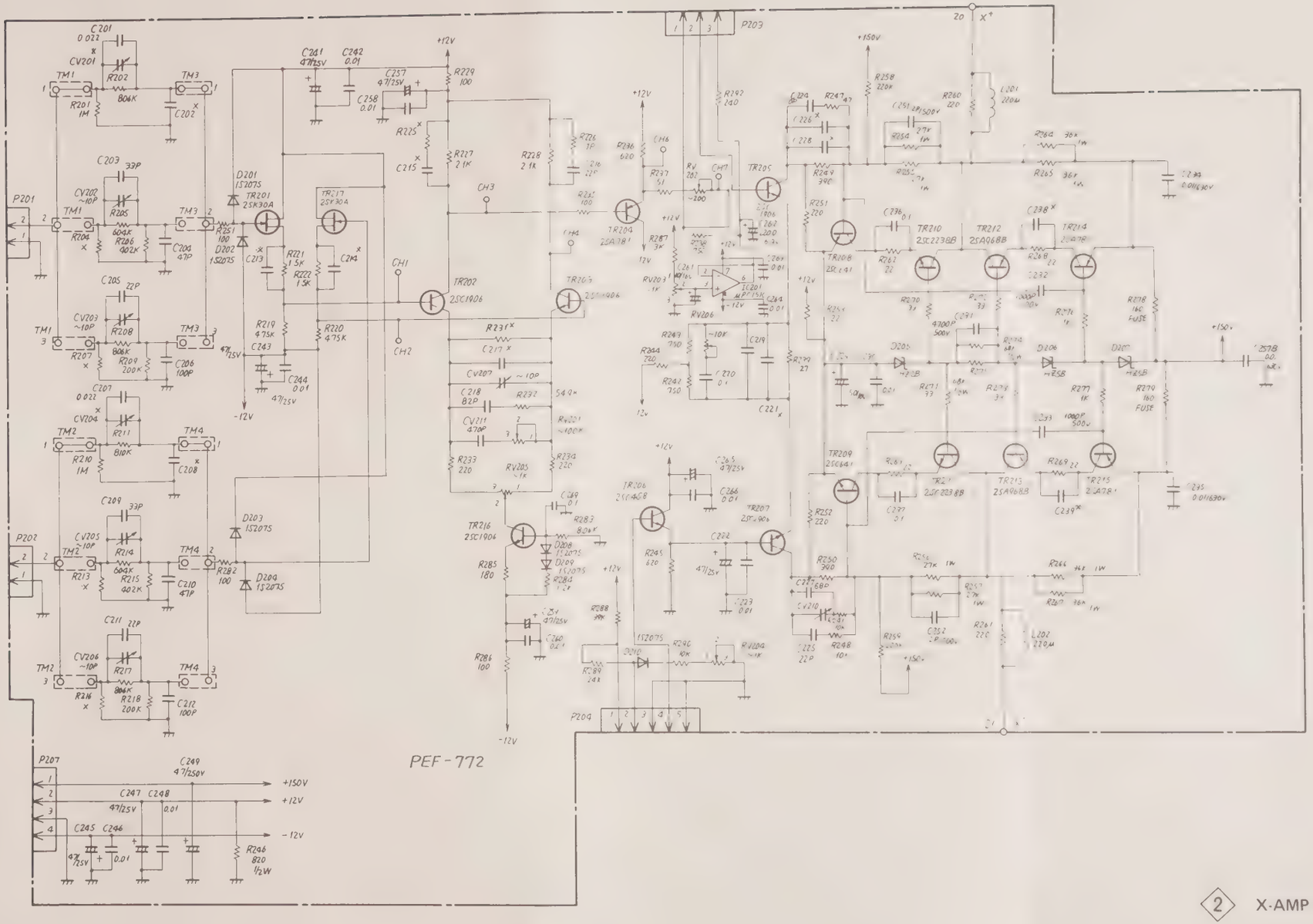
Symbol	Part Code	Description	Remarks
D 901	HDS0250	Diode 1SS83	
D 902	HDS0250	Diode 1SS83	
D 903	HDS0250	Diode 1SS83	
D 908	HDS0108	Diode 1S2075K	
D 909	HDS0108	Diode 1S2075K	
D 910	HDS0108	Diode 1S2075K	
D 907	HDS0108	Diode 1S2075K	
TR 901	HTC0192	Transistor 2SC641K	
TR 902	HTC0148	Transistor 2SC458C	
TR 903	HTB0087	Transistor 2SB648A	
TR 904	HTD0100	Transistor 2SD668A	
TR 905	HTA0104	Transistor 2SA778AK	
TR 909	8460805	Transistor μPA 68H.M	
TR 910	HTC0338	Transistor 2SC1906	
TR 911	HTC0338	Transistor 2SC1906	
TR 912	HTC0338	Transistor 2SC1906	
TR 913	HTC0338	Transistor 2SC1906	
R 901	RCR3076	R, Carbon 1/4W 10kΩ ±5%	
R 902	RCR3101	R, Carbon 1/4W 150kΩ ±5%	
R 903	RCR3082	R, Carbon 1/4W 18kΩ ±5%	
R 904	RCR3100	R, Carbon 1/4W 100kΩ ±5%	
R 905	RCR3056	R, Carbon 1/4W 1.5kΩ ±5%	
R 906	RCR3028	R, Carbon 1/4W 100Ω ±5%	
R 907	RCR3102	R, Carbon 1/4W 220kΩ ±5%	
R 908	RCR3080	R, Carbon 1/4W 15kΩ ±5%	
R 909	RCR3052	R, Carbon 1/4W 1.0kΩ ±5%	
R 910	RCR3040	R, Carbon 1/4W 330Ω ±5%	
R 911	RCR3088	R, Carbon 1/4W 33kΩ ±5%	
R 912	RCR3004	R, Carbon 1/4W 10Ω ±5%	
R 913	RCR3071	R, Carbon 1/4W 6.2kΩ ±5%	
R 925	RCR3045	R, Carbon 1/4W 510Ω ±5%	
R 926	RCR3088	R, Carbon 1/4W 33kΩ ±5%	
R 927	RCR3106	R, Carbon 1/4W 1MΩ ±5%	
R 928	RMV0006	R, Metal 1/2W 12MΩ ±5%	
R 929	RCR3106	R, Carbon 1/4W 1MΩ ±5%	
R 933	RCR3106	R, Carbon 1/4W 1MΩ ±5%	
R 938	RCR3063	R, Carbon 1/4W 3kΩ ±5%	
R 939	RME1017	R, Metal 1/4W 5.49kΩ ±1%	
R 940	RME1017	R, Metal 1/4W 5.49kΩ ±1%	
R 941	RCR3055	R, Carbon 1/4W 1.3kΩ ±5%	
R 944	RCR3035	R, Carbon 1/4W 200Ω ±5%	
R 945	RCR3035	R, Carbon 1/4W 200Ω ±5%	
R 946	RCR3028	R, Carbon 1/4W 100Ω ±5%	
R 947	RCR3056	R, Carbon 1/4W 1.5kΩ ±5%	
R 958	RCR3052	R, Carbon 1/4W 1kΩ ±5%	
R 951	RCR3071	R, Carbon 1/4W 6.2kΩ ±5%	
R 952	RCR3090	R, Carbon 1/4W 39kΩ ±5%	
R 953	RCR3054	R, Carbon 1/4W 1.2kΩ ±5%	
R 949	RCR3052	R, Carbon 1/4W 1kΩ ±5%	
R 950	RCR3052	R, Carbon 1/4W 1kΩ ±5%	
RV 901	RNT0188	VR, Metal EVN38CA00B13	
P 906	8466952A	Connector 171825-2	
P 907	8466952A	Connector 171825-2	

Symbol	Part Code	Description	Remarks

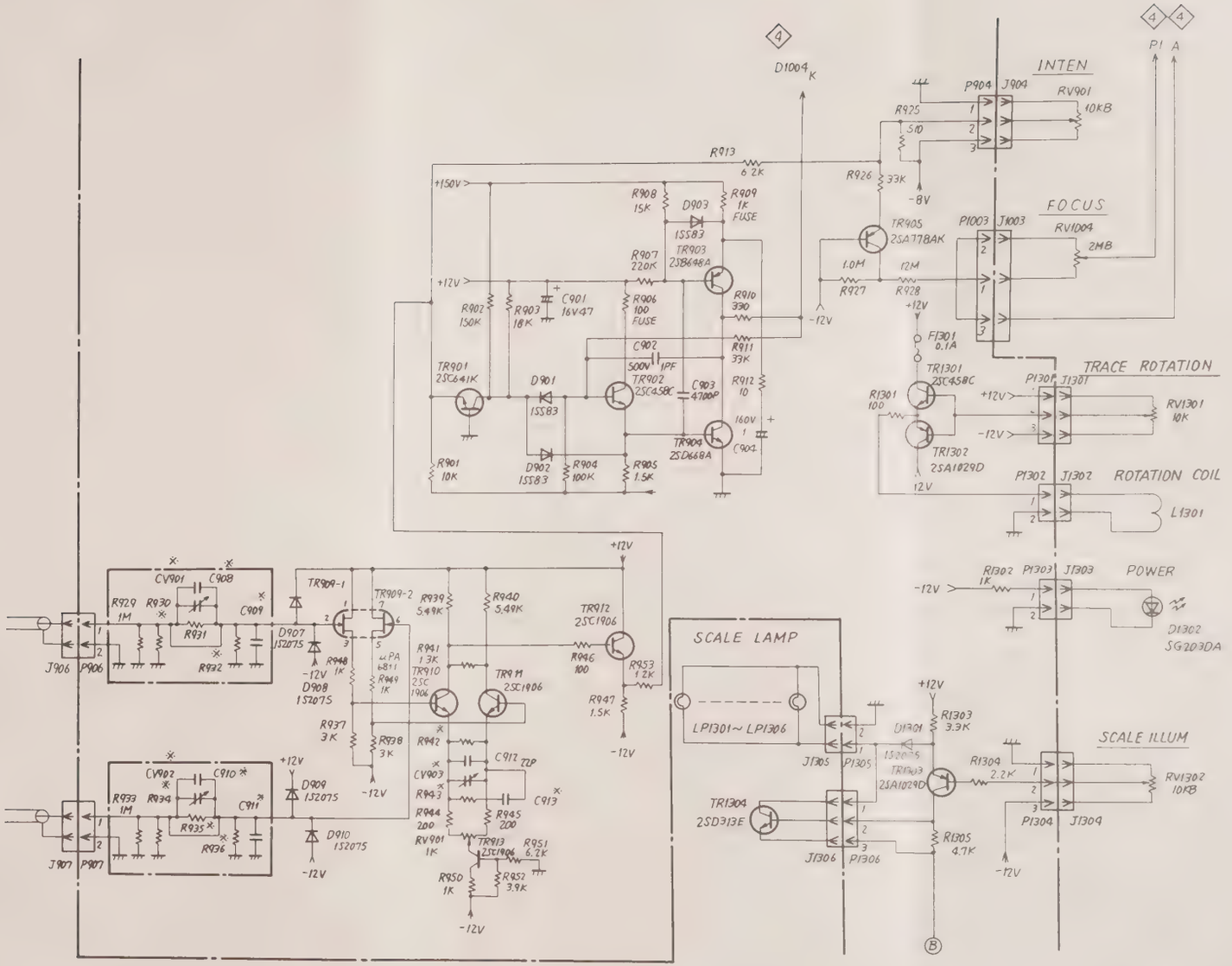
8. SCHEMATIC DIAGRAMS

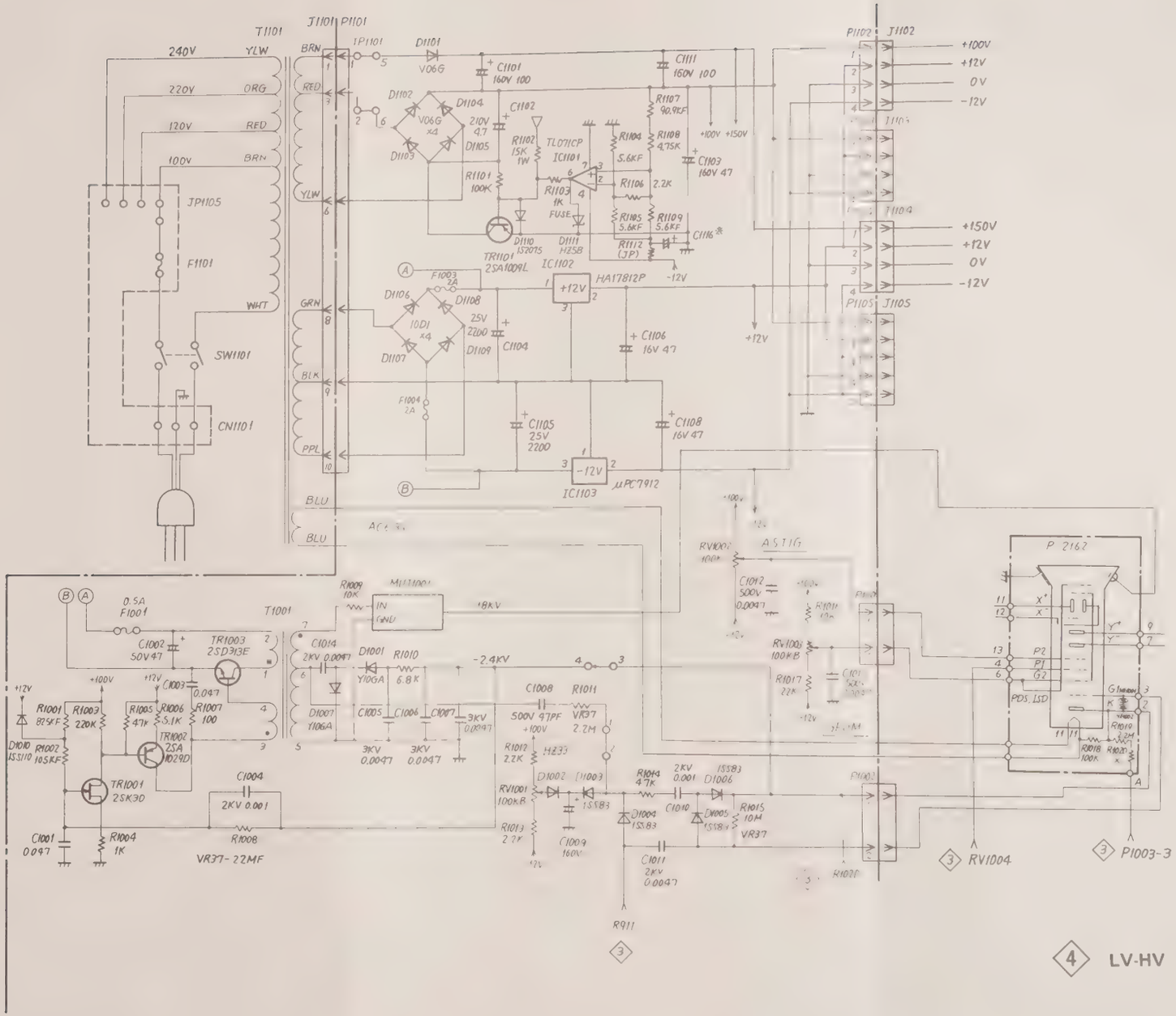


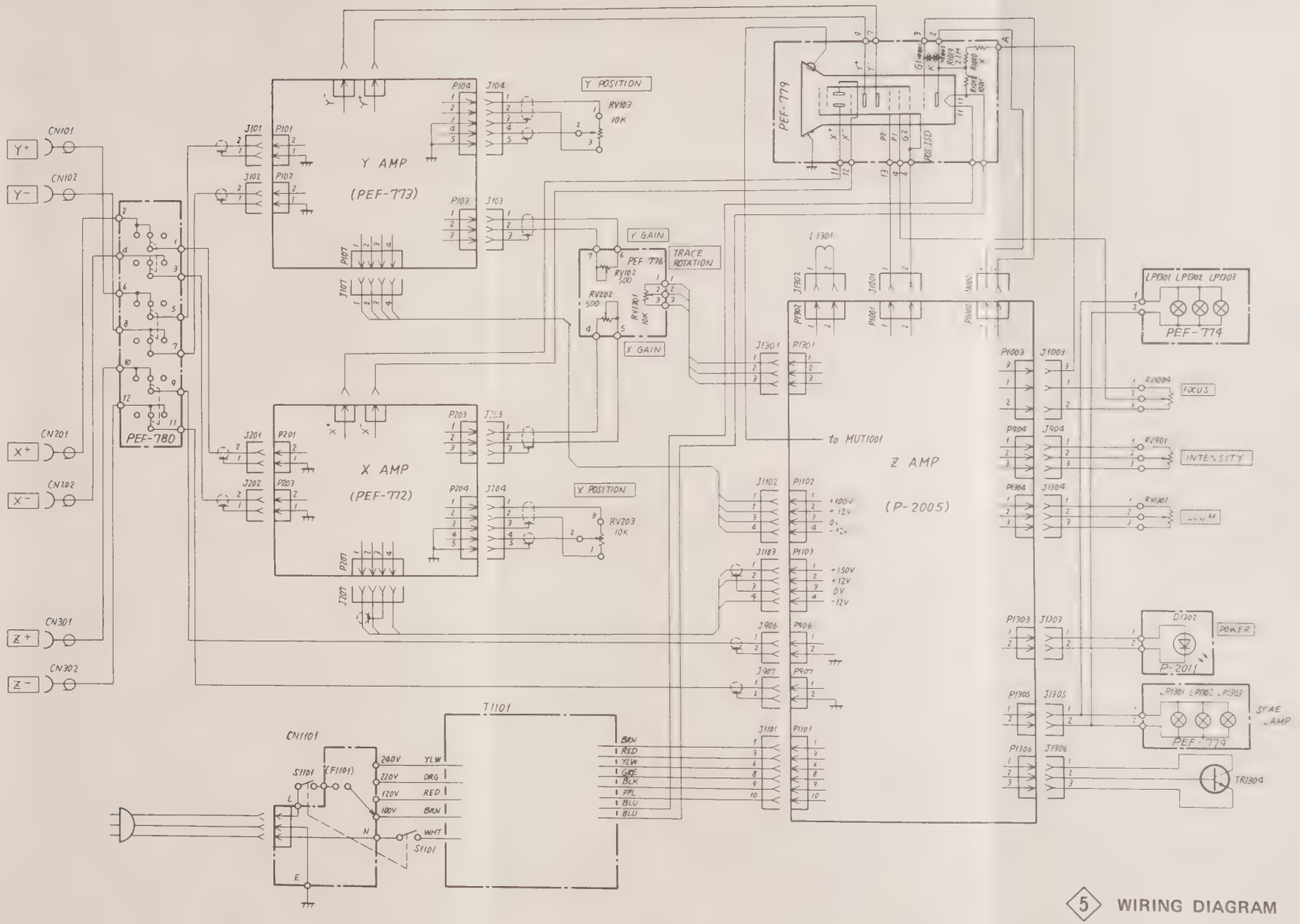
1 Y-AMP


PEF-772
P201
P202
P203
P204
P207
TR201 2SK30A
TR202 2SC1906
TR203 2SC1906
TR204 2SA781
TR205
TR206 2SC1468
TR207 2SC1906
TR208 2SC641
TR209 2SC641
TR210 2SC2238B
TR211 2SA968B
TR212 2SC2238B
TR213 2SA968B
TR214 2SA78
TR215 2SA78
TR216 2SC1906
TR217 2SK30A
IC201 M5153L
+150V
+12V
-12V
CH1
CH2
CH3
CH6
CH7
X+
L201 220μ
L202 220μ
FUSE
P207
+150V
+12V
-12V

2 X-AMP


INTEN
FOCUS
TRACE ROTATION
ROTATION COIL
POWER
SCALE LAMP
SCALE ILLUM
LP1301~LP1306
+150V
+12V
-12V
-8V
+1.2V
-1.2V
P1 A
J906 P906
J907 P907
P904 J904
P1003 J1003
P1301 J1301
P1302 J1302
P1303 J1303
J1305 P1305
J1306 P1306
P1304 J1304
D1004 K
D1301
D1302 SG203DA
L1301
FI301 0.1A
TR901 2SC641K
TR902 2SC458C
TR903 2SB648A
TR904 2SA778AK
TR909 2SD668A
TR910 2SC1906
TR911 2SC1906
TR912 2SC1906
TR913 2SC1906
TR1301 2SC458C
TR1302 2SA1029D
TR1303 2SA1029D
TR1304 2SD313E
D901 1SS83
D902 1SS83
D903 1SS83
D907 1S2075
D908 1S2075
D909 1S2075
D910 1S2075
R901 10K
R902 150K
R903 18K
R904 100K
R905 1.5K
R906 100 FUSE
R907 220K
R908 15K
R909 1K FUSE
R910 390
R911 33K
R912 10
R913 6.2K
R925 510
R926 33K
R927 1.0M
R928 12M
R929 1M
R930
R931
R932
R933 1M
R934
R935
R936
R937 3K
R938 3K
R939 5.49K
R940 5.49K
R941 1.3K
R942
R943
R944 200
R945 200
R946 100
R947 1.5K
R948 1K
R949 1K
R950 1K
R951 6.2K
R952 3.9K
R953 1.2K
R1301 100
R1302 1K
R1303 3.3K
R1304 2.2K
R1305 4.7K
C901 16V47
C902 500V 1PF
C903 4700P
C904 160V 1
C907 152P
C908
C909
C910
C911
C912 72P
C913
CV901
CV902
CV903
RV901 10KB
RV1004 2MB
RV1301 10K
RV1302 10KB
RV901 1K
3 Z-AMP


T1101
J1101 P1101
240V
220V
120V
100V
YLW
ORG
RED
BRN
WHT
GRN
BLK
PPL
BLU
JP1105
F1101
SW1101
CN1101
D1101 V06G
C1101 160V 100
C1111 160V 100
D1102 D1103 D1104 D1105 V06G x4
C1102 210V 47
R1102 15K 1W
R1101 100K
TL071CP IC1101
R1103 1K FUSE
R1104 5.6KF
R1106 2.2K
R1105 5.6KF
R1109 5.6KF
R1107 90.9KF
R1108 4.75K
C1103 160V 47
D1110 1S2075
D1111 HZ5B
R1112 (JP)
C1116*
TR1101 2SA1009L
IC1102 HA17812P
+12V
-12V
F1003 2A
D1106 D1107 D1108 D1109 10D1 x4
25V 2200
C1104
+ C1106 16V 47
F1004 2A
C1105 25V 2200
C1108 16V 47
IC1103 µPC7912
P1102 J1102
+100V
+12V
0V
-12V
J1103
J1104
+150V
+12V
0V
-12V
P1105 J1105
0.5A F1001
T1001
C1002 50V 47
TR1003 2SD313E
R1009 10K
M61100L
IN GND
18KV
C1014 2KV 0.0047
D1001 Y10GA
R1010 6.8K
-2.4KV
D1007 Y10GA
C1005 C1006 C1007 3KV 0.0047
C1008 500V 47PF
R1011 VR37 2.2M
R1012 2.2K
HZ33
C1003 0.047
R1001 82KF
R1003 220K
R1005 47K
R1006 5.1K
R1007 100
TR1002 2SA1029D
D1010 1SS110
R1002 105KF
TR1001 2SK30
C1001 0.047
R1004 1K
C1004 2KV 0.001
R1008 VR37-22MF
RV1001 100KB
D1002 D1003 1SS83
R1013 2.2K
R1014 4.7K
2KV 0.001
D1006
D1004 1SS83
D1005 1SS83
C1009 160V
C1010
R1015 10M VR37
C1011 2KV 0.0047
R911
RV1002 100K
A.STIG
C1012 500V 0.0047
RV1003 100KB
R1017 22K
R1018 100K
R1019
R1020
P 2162
X+ X- Y+ Y-
P2 P1 G2 G1
PDS. LSD
③ RV1004
③ P1003-3
④ LV-HV

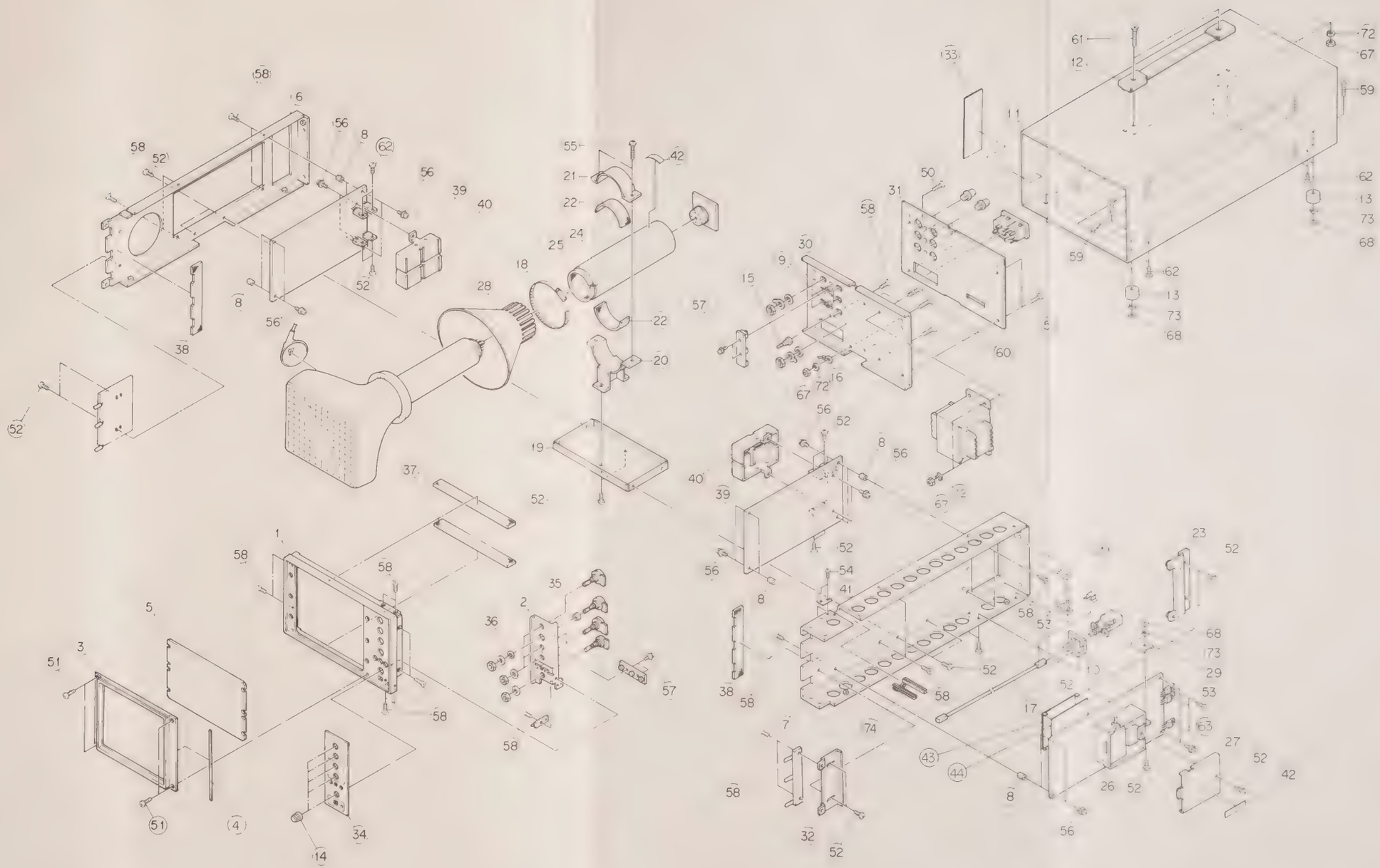


5 WIRING DIAGRAM

9. MECHANICAL PARTS LIST AND EXPLODED VIEW

Symbol	Part Code	Description	Qty
1	2118190A	Chassis Front	1
2	8462303A	Bracket	1
3	2118131A	Bezel	1
4	8463393A	Filter (1)	1
5	8463392A	Filter (2)	1
6	2118189A	Chassis L	1
7	2118187A	Chassis R	1
8	8463405A	Spacer	10
9	8462306A	Spacer	2
10	8462309A	Bracket Pow	1
11	2118188A	Cover	1
12	8466334A	Handle	1
13	8466335A	Foot	4
14	3149324B	Knob-S18B	5
17	3180083AA	Knob-PW	1
18	8466340A	Band	1
19	8462304A	Chassis CRT	1
20	8462305A	CRT Band	1
21	8463396A	CRT Band	1
22	8463397A	Rubber	2
23	8463398A	Heat Sink	1
24	8463399A	Shield Band	1
25	8463400A	Rubber Plate	1
26	8463401A	Shield Case,, HV	1
27	8463402A	Shield Cover, HV	1
28	8463391A	Shield Case, CRT	1
29	8463407A	Heat Sink	1
30	3205631A	Chassis Rear	1
31	2118191A	Panel Rear	1
32	8462307A	Bracket	2
33	8466333A	Insulater	1
34	8466332A	Panel Front	1
35	8463403A	Insulator	1
36	8463404A	Insulator	1
37	8463394A	Cushion	4
38	8463395A	Cushion	2
39	8462310A	Heat Sink	2
40	8462310B	Heat Sink	2
41	8462308A	Earth Plate	1
42	4058852A	Label	1
50	XCA6308	Screw 3 x 8	1
5	8466336A	Screw 3 x 8	1
52	XCA6306	Screw 3 x 6	30
53	XCA6005	Screw 2.6 x 5	1
54	XCA6205	Screw 2 x 5	2
55	XCA6312	Screw 3 x 12	2
56	XCA0689	Screw Sems 3 x 6	14
57	8345937G	Screw Sems 2.6 x 5	1
58	XCA0032	Screw Flat 3 x 5	24
59	XCA7310	Screw Flat 3 x 10	4
60	XCA7408	Screw Flat 4 x 8	5
61	XCA74 6	Screw Flat 4 x 16	2
62	XCA0668	Screw Flat 2.6 x 5	2
67	XCA1707	Nut 4	7
68	XCA1706	Nut 3	8
72	XCA1881	Washer, Spring 4	7
73	XCA1879	Washer, Spring 3	5

Symbol	Part Code	Description	Qty



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